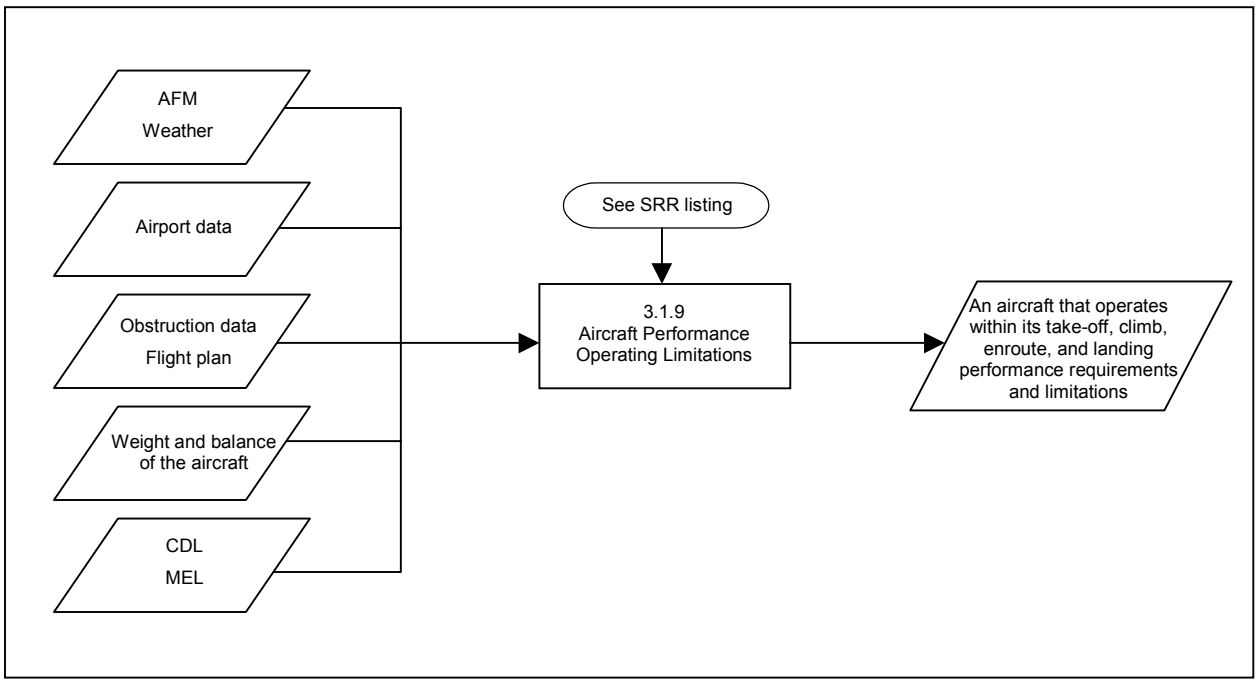
Safety Attribute Inspection (SAI) Job Aid



ELEMENT SUMMARY INFORMATION

Element: 3.1.9 Aircraft Performance Operating Limitations

Purpose of this Element (Air Carrier's responsibility): To ensure aircraft are operated within the performance limitations of the Aircraft Flight Manual (AFM).

Objective (FAA responsibility): To determine if the operator adheres to its procedures covering the operation of aircraft within the performance limitations of the AFM.

Inputs:
- AFM
- Weather
- Airport Data
- Obstruction Data
- Flight Plan
- Weight and Balance of the Aircraft
- CDL
- MEL

Outputs:
- An aircraft that operates within its take-off, climb, enroute, and landing performance requirements and limitations.

Performance Measures:

- Take-off performance; [121.173 (c), 121.175 (a, b, d), 121.199 (a), 121.177 (a), 121.189 (a-e)]
- Climb performance; [121.179 (a), 121.181 (a, c)]
- Enroute performance; [121.183 (a), 121.201 (a, b), 121.191 (a), 121.193 (a-c)]
- Landing performance; [121.175 (c, e), 121.181 (b), 121.185 (a, b), 121.187 (a), 121.198 (b), 121.195 (a-c), 121.197, 121.203 (a), 121.205]
- Destination airport; and
- Alternate airport runway.

SRR:

- 121.173 (a - c, e) Airplane Performance Operating Limitations, General.
- 121.175 (a-e) Airplanes: reciprocating engine powered: Weight limitations.
- 121.177 (a) Airplanes: Reciprocating engine powered: Takeoff limitations.
- 121.179 (a) Airplanes: reciprocating engine powered: Enroute limitations: all engines operating.
- 121.181 (a-c) Airplanes: Reciprocating engine powered: Enroute limitations: One engine inoperative.
- 121.183 (a) Part 25 airplanes with four or more engines: Reciprocating engine powered: Enroute limitations: Two engines inoperative.
- 121.185 (a, b) Airplanes: Reciprocating engine powered: Landing limitations: Destination airport.
- 121.187 (a) Airplanes: Reciprocating engine powered: Landing limitations: Alternate airport.
- 121.189 (a-e) Airplanes: Turbine engine powered; takeoff limitations.
- 121.191 (a) Airplanes: Turbine engine powered: Enroute limitations: One engine inoperative.
- 121.193 (a-c) Airplanes: Turbine engine powered: Enroute limitations: Two engines inoperative.
- 121.195 (a-e) Airplanes: Turbine engine powered: Landing limitations: Destination airports.
- 121.197 Airplanes: Turbine engine powered: Landing limitations: Alternate airports.
- 121.199 (a) Nontransport category airplanes: Takeoff limitations.
- 121.201 (a, b) Nontransport category airplanes: Enroute limitations: One engine inoperative.
- 121.203 (a) Nontransport category airplanes: Landing limitations: Destination airport.
- 121.205 Nontransport category airplanes: Landing limitations: Alternate airport.
- 121.207 (a, b) Provisionally certificated airplanes: Operating limitations.

Other CFRs and/or FAA Guidance:

- FAA Order 8400.10, Volume 4, Chapter 3, Airplane Performance and Airport Data.

SRR SPECIFIC INFORMATION

SRR	Intent	Inspectors
121.173 (a)	To require that all air carriers operating reciprocating engine powered airplanes do so in accordance with CFR (121.175 - 121.187).	***Certification:*** *Operations* ***Surveillance:*** *Operations*
121.173 (b)	To require that all air carriers operating turbine engine powered air planes do so in accordance with CFR (121.189 - 121.197).	***Certification:*** *Operations* ***Surveillance:*** *Operations*
121.173 (c)	To require that all air carriers operating large non-transport category air planes, type certificated before 1/1/65, operate in accordance with CFR (121.199 - 121.205) using approved performance data.	***Certification:*** *Operations* ***Surveillance:*** *Operations*
121.173 (e)	To require that take-off performance be corrected for ambient temperatures.	***Certification:*** *Operations* ***Surveillance:*** *Operations*
121.175 (a-e)	To specify performance data and maximum take-off and landing weight for reciprocating engine powered airplanes.	***Certification:*** *Operations* ***Surveillance:*** *Operations*
121.177 (a)	To specify take-off limitations for reciprocating engine powered airplanes.	***Certification:*** *Operations* ***Surveillance:*** *Operations*
121.179 (a)	To specify climb performance for reciprocating engine powered airplanes with all engines operating.	***Certification:*** *Operations* ***Surveillance:*** *Operations*
121.181 (a-c)	To specify climb performance for reciprocating engine powered airplanes with one engine inoperative.	***Certification:*** *Operations* ***Surveillance:*** *Operations*
121.183 (a)	To specify enroute performance requirements for reciprocating engine powered airplanes having four engines with two engines inoperative.	***Certification:*** *Operations* ***Surveillance:*** *Operations*
121.185 (a, b)	To specify landing performance requirements and runway limitations for reciprocating engine powered airplanes.	***Certification:*** *Operations* ***Surveillance:*** *Operations*
121.187 (a)	To specify landing distance requirements for designating alternate airports for reciprocating engine powered airplanes	***Certification:*** *Operations* ***Surveillance:*** *Operations*
121.189 (a-e)	To specify take-off limitations for turbine powered airplanes.	***Certification:*** *Operations* ***Surveillance:*** *Operations*
121.191 (a)	To specify climb performance for turbine powered airplanes with one engine inoperative.	***Certification:*** *Operations* ***Surveillance:*** *Operations*

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SRR	Intent	Inspectors
121.193 (a-c)	To specify enroute performance requirements for turbine powered airplanes having three or more engines with two inoperative.	***Certification:*** *Operations* ***Surveillance:*** *Operations*
121.195 (a-e)	To specify landing performance requirements and runway limitations for turbine powered airplanes.	***Certification:*** *Operations* ***Surveillance:*** *Operations*
121.197	To specify landing distance requirements for designating alternate airports for turbine powered airplanes.	***Certification:*** *Operations* ***Surveillance:*** *Operations*
121.199 (a)	To specify the take-off performance requirements for non-transport category airplanes.	***Certification:*** *Operations* ***Surveillance:*** *Operations*
121.201 (a, b)	To specify the climb performance for non-transport category airplanes with one engine inoperative.	***Certification:*** *Operations* ***Surveillance:*** *Operations*
121.203 (a)	To specify the landing performance requirements and runway limitations for non-transport category airplanes.	***Certification:*** *Operations* ***Surveillance:*** *Operations*
121.205	To specify the landing distance requirements for designating alternate airports for non-transport category airplanes.	***Certification:*** *Operations* ***Surveillance:*** *Operations*
121.207 (a, b)	To specify the operating limitations for provisionally certified airplanes.	***Certification:*** *Operations* ***Surveillance:*** *Operations*

3.1.9 Aircraft Performance Operating Limitations

SECTION 1 - RESPONSIBILITY ATTRIBUTE

Objective: To determine if there is a clearly identifiable, qualified, and knowledgeable person who is accountable for the quality of the Aircraft Performance Operating Limitations process.

To meet this objective, the inspector will accomplish the following tasks:

1. Identify the person who is responsible for the quality of the Aircraft Performance Operating Limitations process.
2. Review the description in the Manual that delineates the duties and responsibilities of the person.
3. Evaluate the person's qualifications and work experience (or resume', if appropriate).
4. Review the appropriate organizational chart.
5. Discuss the Aircraft Performance Operating Limitations process with the person.

To meet this objective, the inspector will determine and record answers to the following questions:

1. Is there a clearly identifiable person who is answerable for the quality of the Aircraft Performance Operating Limitations process?	❑ **YES** **If yes, provide the name:** ❑ **NO** **If no, explain:**
2. Does the person understand the procedures associated with the Aircraft Performance Operating Limitations process?	❑ **YES** **If no, explain:** ❑ **NO**
3. Does the person understand the controls associated with the Aircraft Performance Operating Limitations process?	❑ **YES** **If no, explain:** ❑ **NO**
4. Does the person understand the interfaces associated with the Aircraft Performance Operating Limitations process?	❑ **YES** **If no, explain:** ❑ **NO**
5. Does the person understand the process measurements associated with the Aircraft Performance Operating Limitations process?	❑ **YES** **If no, explain:** ❑ **NO**
6. Is the responsibility of this position clearly documented in the air carrier's Manual(s)?	❑ **YES** **If no, explain:** ❑ **NO**
7. Are the qualification standards for this position clearly documented?	❑ **YES** **If no, explain:** ❑ **NO**
7a Are the qualification standards for this position appropriate for the duties that are assigned?	❑ **YES** **If no, explain:** ❑ **NO**
8. Does the person meet the qualification standards?	❑ **YES** **If no, explain:** ❑ **NO**
9. Does the person acknowledge that he/she has responsibility for the Aircraft Performance Operating Limitations process?	❑ **YES** **If no, explain:** ❑ **NO**
10. Does the person know who has authority to establish and modify the Aircraft Performance Operating Limitations process?	❑ **YES** **If no, explain:** ❑ **NO**

3.1.9 Aircraft Performance Operating Limitations

SECTION 2 – AUTHORITY ATTRIBUTE

Objective: To determine if there is a clearly identifiable, qualified, and knowledgeable person with the authority to establish and modify the Aircraft Performance Operating Limitations process.

To meet this objective, the inspector will accomplish the following tasks:

1. Identify the person who has the authority to establish or modify the Aircraft Performance Operating Limitations process.
2. Review the description in the Manual that delineates the duties and responsibilities of the person.
3. Evaluate the person's qualifications and work experience (or resume', if appropriate).
4. Review the appropriate organizational chart.
5. Discuss the Aircraft Performance Operating Limitations process with the person.

To meet this objective, the inspector will determine and record answers to the following questions:

1. Is there a clearly identifiable person who has authority to establish and modify the air carrier's policies for the Aircraft Performance Operating Limitations process?	❑ **YES** **If yes, provide the name:** ❑ **NO** **If no, explain:**
2. Does the person understand the procedures associated with the Aircraft Performance Operating Limitations process?	❑ **YES** **If no, explain:** ❑ **NO**
3. Does the person understand the controls associated with the Aircraft Performance Operating Limitations process?	❑ **YES** **If no, explain:** ❑ **NO**
4. Does the person understand the interfaces associated with the Aircraft Performance Operating Limitations process?	❑ **YES** **If no, explain:** ❑ **NO**
5. Does the person understand the process measurements associated with the Aircraft Performance Operating Limitations process?	❑ **YES** **If no, explain:** ❑ **NO**
6. Is the authority of this position clearly documented in the air carrier's Manual(s)?	❑ **YES** **If no, explain:** ❑ **NO**
7. Are the qualification standards for this position clearly documented?	❑ **YES** **If no, explain:** ❑ **NO**
7a Are the qualification standards for this position appropriate for the duties that are assigned?	❑ **YES** **If no, explain:** ❑ **NO**
8. Does the person meet the qualification standards?	❑ **YES** **If no, explain:** ❑ **NO**
9. Does the person acknowledge that he/she has authority for the Aircraft Performance Operating Limitations process?	❑ **YES** **If no, explain:** ❑ **NO**
10. Does the person know who has the responsibility for the Aircraft Performance Operating Limitations process?	❑ **YES** **If no, explain:** ❑ **NO**
11. Are the procedures for delegation of authority clearly documented for the Aircraft Performance Operating Limitations process?	❑ **YES** **If no, explain:** ❑ **NO**

3.1.9 Aircraft Performance Operating Limitations

SECTION 3 – PROCEDURES ATTRIBUTE

Objective: To determine if the air carrier has documented procedures for accomplishing the Aircraft Performance Operating Limitations process.

To meet this objective, the inspector will accomplish the following tasks:

1. Review the documented instructions and information related to the Aircraft Performance Operating Limitations process to ensure that they contain who, what, where, when, and how.
2. Review the FAA Guidance and Specific Regulatory Requirements (SRR) included in the supplemental information section of this SAI.
3. Discuss the Aircraft Performance Operating Limitations process with appropriate personnel to gain an understanding of the procedures.
4. Observe the Aircraft Performance Operating Limitations process to gain an understanding of the procedures.

To meet this objective, the inspector will determine and record answers to the following questions:

1. Do written procedures exist to achieve the desired result of the Aircraft Performance Operating Limitations process:	
1.1 Do written procedures exist identifying the required inputs for computing performance data? (e.g. weather, MEL, CDL, AFM, airport data, weight and balance data, flight plan)? [SRR 121.173 (c), 121.175 (a-e), 121.177 (a), 121.179 (a), 121.181 (a-c), 121.183 (a), 121.185 (a, b), 121.187 (a), 121.189 (a-e), 121.191 (a), 121.193 (a-c), 121.195 (a-e), 121.197, 121.199 (a), 121.201 (a-b), 121.203 (a), 121.205]	❑ YES ❑ NO ❑ N/A **If no or N/A, explain:**
1.2 Do written procedures exist for the collection of required data?	❑ YES ❑ NO ❑ N/A **If no or N/A, explain:**
1.3 Do written procedures exist for the computation of performance data?	❑ YES ❑ NO ❑ N/A **If no or N/A, explain:**
1.4 Do written procedures exist for verifying the accuracy of performance computations?	❑ YES ❑ NO ❑ N/A **If no or N/A, explain:**
1.5 Do written procedures exist for the guidance of dispatchers and flight crews to ensure that enroute driftdown performance is considered for airplanes without fuel dumping capabilities?	❑ YES ❑ NO ❑ N/A **If no or N/A, explain:**
2. Do the procedures identify: who, what, where, when and how?	❑ YES ❑ NO **If no, explain:**
3. Are the procedures in compliance with the CFR(s)?	❑ YES ❑ NO **If no, explain:**

3.1.9 Aircraft Performance Operating Limitations ***SECTION 3 – PROCEDURES ATTRIBUTE***	
4. Do the procedures conform to other written guidance (E.g., Operations Specifications, FAA Orders, Airworthiness Directives, Advisory Circulars, Handbook Bulletins, Directives, and Manufacturer's Recommendations)?	❑ **YES** **If no, explain:** ❑ **NO**
5. Does the air carrier have the resources to support the written procedures for the Aircraft Performance Operating Limitations process?	❑ **YES** **If no, explain:** ❑ **NO**
6. If alternate procedures exist for use during irregular conditions, do they achieve the same desired results as the primary procedures so that an equivalent level of safety is maintained? (E.g., a manual system used as a result of equipment failure).	❑ **YES** **If no, explain:** ❑ **NO** ❑ **N/A, No alternate procedures exist for this element**
7. Are the procedures published in different manuals relating to the Aircraft Performance Operating Limitations process consistent?	❑ **YES** **If no, explain:** ❑ **NO**
8. Does the air carrier have a documented method for assessing the impacts of procedural changes to the Aircraft Performance Operating Limitations process?	❑ **YES** **If no, explain:** ❑ **NO**

3.1.9 Aircraft Performance Operating Limitations

SECTION 4 – CONTROL ATTRIBUTE

Objective: To determine if checks and restraints are designed into the Aircraft Performance Operating Limitations process to ensure a desired result is achieved.

To meet this objective, the inspector will accomplish the following tasks:

1. Review the documented instructions and information related to the Aircraft Performance Operating Limitations process.
2. Review the FAA Guidance and Specific Regulatory Requirements (SRR) included in the supplemental information section of this SAI
3. Discuss the Aircraft Performance Operating Limitations process with appropriate personnel to gain an understanding of the controls.
4. Observe the Aircraft Performance Operating Limitations process to gain an understanding of the controls.

To meet this objective, the inspector will determine and record answers to the following questions:

1. Are the following checks and restraints built into the Aircraft Performance Operating Limitations process:

1.1	*Does the air carrier verify that the inputs required for computing performance data are used?*	❑ YES ❑ NO ❑ N/A **If no or N/A, explain:**
1.2	*Does the Air Carrier have performance computations verified by a second person?*	❑ YES ❑ NO ❑ N/A **If no or N/A, explain:**
1.3	*Does the air carrier verify that current data is being used in their performance computations?*	❑ YES ❑ NO ❑ N/A **If no or N/A, explain:**
1.4	*Does the Air Carrier verify that performance penalties are taken when appropriate? (e.g. contaminated runway, tailwind, anti-skid inop, etc.)*	❑ YES ❑ NO ❑ N/A **If no or N/A, explain:**
1.5	*Does the air carrier use performance data from approved sources? [SRR 121.189 (a-e), 121.193 (b, c), 121.195 (a, b, d, e), 121.201 (b)]*	❑ YES ❑ NO ❑ N/A **If no or N/A, explain:**
1.6	*Does the Air Carrier verify the accuracy and currency of performance data obtained from outside sources?*	❑ YES ❑ NO ❑ N/A **If no or N/A, explain:**
1.7	*Does the air carrier verify that obstruction data is obtained from approved sources?*	❑ YES ❑ NO ❑ N/A **If no or N/A, explain:**
1.8	*Does the air carrier verify that airport data is obtained from approved sources?*	❑ YES ❑ NO ❑ N/A **If no or N/A, explain:**

3.1.9 Aircraft Performance Operating Limitations ***SECTION 4 – CONTROL ATTRIBUTE***	
1.9 Does the Pilot in Command verify the flight plan to ensure that the airplane can meet all performance requirements, including driftdown if required?	❑ **YES** **If no or N/A, explain:** ❑ **NO** ❑ **N/A**
1.10 Does the Pilot in Command verify that the assigned runway matches the performance computations?	❑ **YES** **If no or N/A, explain:** ❑ **NO** ❑ **N/A**
2. Do the checks and restraints ensure the desired result is achieved for the Aircraft Performance Operating Limitations process?	❑ **YES** **If no, explain:** ❑ **NO**
3. Does the air carrier have a documented method for assessing the impacts of any changes made to checks and restraints in the Aircraft Performance Operating Limitations process?	❑ **YES** **If no, explain:** ❑ **NO**
4. Does the air carrier have the resources to support the checks and restraints for the Aircraft Performance Operating Limitations process?	❑ **YES** **If no, explain:** ❑ **NO**

3.1.9 Aircraft Performance Operating Limitations

SECTION 5 - PROCESS MEASUREMENT ATTRIBUTE

Objective: To determine if the air carrier measures and assesses the Aircraft Performance Operating Limitations process, to identify and correct problems or potential problems.

To meet this objective, the inspector will accomplish the following tasks:

1. Review the documented instructions and information related to the Aircraft Performance Operating Limitations process.
2. Discuss the Aircraft Performance Operating Limitations process with appropriate personnel to gain an understanding of the process measures.
3. Observe the Aircraft Performance Operating Limitations process to gain an understanding of the process measures.

To meet this objective, the inspector will determine and record answers to the following questions:

1. <Deleted>
2. Does the air carrier's Aircraft Performance Operating Limitations process include the following process measurements?

2.1 Does the Air Carrier analyze instances where required inputs were not used for performance calculations?	❑ YES ❑ NO ❑ N/A	**If no or N/A, explain:**
2.2 Does the Air Carrier analyze instances where performance calculations were discovered to be inaccurate?	❑ YES ❑ NO ❑ N/A	**If no or N/A, explain:**
2.3 Does the Air Carrier have a process for determining the currency of data used by themselves or by an outside contractor?	❑ YES ❑ NO ❑ N/A	**If no or N/A, explain:**
2.4 Does the Air Carrier compare the results of performance computations to the AFM limits?	❑ YES ❑ NO ❑ N/A	**If no or N/A, explain:**
2.5 Does the Air Carrier solicit and analyze feedback from flight crewmembers regarding problems with performance data?	❑ YES ❑ NO ❑ N/A	**If no or N/A, explain:**
2.6 Does the Air Carrier solicit and analyze feedback from others regarding problems with performance data? (e.g. ATC , complaints, FOQA, airports)?	❑ YES ❑ NO ❑ N/A	**If no or N/A, explain:**
2.7 Does the Air Carrier require a record of Pilot in Command verification that the assigned runway matches the performance computations?	❑ YES ❑ NO ❑ N/A	**If no or N/A, explain:**
3. Does the air carrier document their process measurement methods and results?	❑ YES ❑ NO	**If no, explain:**
4. Are the air carrier's process measurement methods effective?	❑ YES ❑ NO	**If no, explain:**

3.1.9 Aircraft Performance Operating Limitations ***SECTION 5 - PROCESS MEASUREMENT ATTRIBUTE***	
5. Does the air carrier use their process measurement results to improve their programs?	❑ **YES** **If no, explain:** ❑ **NO**
6. Are the process measurement results accessible to the FAA?	❑ **YES** **If no, explain:** ❑ **NO**
7. Does the organization that conducts the process measurement have direct access to the person with responsibility for the Aircraft Performance Operating Limitations process?	❑ **YES** **If no, explain:** ❑ **NO**
8. Does the air carrier have the resources to support the process measurement for the Aircraft Performance Operating Limitations process?	❑ **YES** **If no, explain:** ❑ **NO**

3.1.9 Aircraft Performance Operating Limitations

SECTION 6 – INTERFACES ATTRIBUTE

Objective: To determine if the air carrier identifies and manages the interactions between the Aircraft Performance Operating Limitations process and the other element processes within the air carrier organization.

To meet this objective, the inspector will accomplish the following tasks:

1. Review the documented instructions and information related to the Aircraft Performance Operating Limitations process.
2. Discuss the Aircraft Performance Operating Limitations process with appropriate personnel to gain an understanding of the interfaces.
3. Observe the Aircraft Performance Operating Limitations process to gain an understanding of the interfaces.

To meet this objective, the inspector will determine and record answers to the following questions:

1. Are the following interfaces identified for the Aircraft Performance Operating Limitations process:

1.1 Maintenance Program (Element 1.3.1)	❑ YES ❑ NO ❑ N/A **If no or N/A, explain:**
1.2 Content Consistency Across Manuals (Element 2.1.2)	❑ YES ❑ NO ❑ N/A **If no or N/A, explain:**
1.3 Operational Control (Element 3.1.4)	❑ YES ❑ NO ❑ N/A **If no or N/A, explain:**
1.4 Safety Program (Element 7.2.1)	❑ YES ❑ NO ❑ N/A **If no or N/A, explain:**
1.5 Dispatch or Flight Release (Element 3.2.1)	❑ YES ❑ NO ❑ N/A **If no or N/A, explain:**
1.6 Flight/Load Manifest/Weight and Balance Control (Element 3.2.2)	❑ YES ❑ NO ❑ N/A **If no or N/A, explain:**
1.7 MEL/CDL Procedures (Element 3.2.3)	❑ YES ❑ NO ❑ N/A **If no or N/A, explain:**
1.8 Training of Flight Crewmembers (Element 4.2.3)	❑ YES ❑ NO ❑ N/A **If no or N/A, explain:**

3.1.9 Aircraft Performance Operating Limitations ***SECTION 6 – INTERFACES ATTRIBUTE***	
1.9 Use of Approved Routes, Areas, and Airports (Element 5.1.6)	❑ **YES** **If no or N/A, explain:** ❑ **NO** ❑ **N/A**
1.10 Manual Currency (Element 2.1.1)	❑ **YES** **If no or N/A, explain:** ❑ **NO** ❑ **N/A**
1.11 (Manual) Distribution (Element 2.1.3)	❑ **YES** **If no or N/A, explain:** ❑ **NO** ❑ **N/A**
1.12 (Manual) Availability (Element 2.1.4)	❑ **YES** **If no or N/A, explain:** ❑ **NO** ❑ **N/A**
2. List any additional interfaces identified:	
3. Are there written procedures for the use of air carrier personnel in the application of these interfaces?	❑ **YES** **If no, explain:** ❑ **NO**
4. Are there controls to ensure that interfaces occur?	❑ **YES** **If no, explain:** ❑ **NO**
5. Are the interfaces between the Aircraft Performance Operating Limitations process and other processes treated consistently in the Manual(s)?	❑ **YES** **If no, explain:** ❑ **NO**